


# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference KI77ZP3860	<b>FOR FURTHER ACTION</b>		See Form PCT/PEA/416
International application No. PCT/PL2004/000064	International filing date (day/month/year) 10.08.2004	Priority date (day/month/year) 14.08.2003	
International Patent Classification (IPC) or national classification and IPC A61B7/02			
Applicant KRYSZTOF, Andrzej			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 7 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau) a total of 17 sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input checked="" type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>			
Date of submission of the demand  03.03.2005		Date of completion of this report  07.04.2005	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer  Willig, H  Telephone No. +49 89 2399-7464	



INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITYInternational application No.  
PCT/PL2004/000064

IAP20 Rec'd PCT/PTO 08 FEB 2006

**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

**Description, Pages**

1-13 received on 07.03.2005 with letter of 03.03.2005

**Claims, Numbers**

1-20 received on 07.03.2005 with letter of 03.03.2005

**Drawings, Sheets**

1/6-6/6 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

4. ☒ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☒ the claims, Nos. 8-13
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/PL2004/000064

**Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 8-13

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):

☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 8-13 are so unclear that no meaningful opinion could be formed (*specify*):

**see separate sheet**

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos.

☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

the written form ☐ has not been furnished

☐ does not comply with the standard

the computer readable form ☐ has not been furnished

☐ does not comply with the standard

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-bis of the Administrative Instructions.

☐ See separate sheet for further details

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/PL2004/000064

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	1-7,16
	No: Claims	14,15,17-20
Inventive step (IS)	Yes: Claims	1-7,16
	No: Claims	14,15,17-20
Industrial applicability (IA)	Yes: Claims	1-7,14-20
	No: Claims	

2. Citations and explanations (Rule 70.7):

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

**10/567556**

International application No.

**IP20 Rec'd PCT/PL 08 FEB 2006**  
PCT/PL2004/000064

Reference is made to the following documents:

- D1: US-A-5 747 752
- D2: US 2003/047376 A1
- D3: US-A-5 847 330
- D4: US-A-5 798 489

**Re Item I**

In the claims and the description, the term "diaphragm portion" has been replaced by "diaphragm cup". For this amendment, no basis can be found in the original application documents. Thus, the subject-matter of the claims and the description goes beyond the disclosure in the international application as filed contrary to Art. 34(2)(b) PCT.

In accordance with Rule 70.2(c) PCT this report is established as if the above amendments had not been made.

**Re Item III**

**Claim 8** is related to a personalizing-identifying ring for a medical stethoscope. The ring is defined as comprising positioning members cooperating with means provided on the diaphragm portion of the stethoscope, the stethoscope and the diaphragm portion not being part of the claimed invention. Since the definition of the means provided on the diaphragm portion of the stethoscope is not at all specific, it is not possible to derive clear features of the positioning member. Therefore, **claim 8** and its dependent **claims 9-13** lack clarity according to Art. 6 PCT, and a reasonable examination in respect of novelty, inventive step and industrial applicability is not possible for these claims.

**Re Item V**

- 1 Document D1 is considered as most relevant prior art document for the subject-matter of **claim 1**. It discloses a stethoscope according to the preamble of **claim 1**.

The characterizing personalizing-identifying ring allows an easy and reliable identification and personalization of the stethoscope.

Personalizing-identifying means for stethoscopes are known in the state of the art. Document D2 proposes the provision of custom indicia provided on the body or diaphragm portion by stamping, laser marking or chemical etching (see para. 27). Document D3 shows an indicia member provided at the conducting tubes of the stethoscope (see fig. 6). In the stethoscope of document D4, a badge or nameplate is provided at a coupler between the lower and upper part of the conduction tube (see figs. 2, 6, col. 4, l. 18-24). A ring according to the characterizing portion of **claim 1**, however, is not disclosed in the available prior art documents.

Therefore, there is no indication for the person skilled in the art to implement the characterizing features into the known stethoscope.

Accordingly, the subject-matter of independent **claim 1** and of its dependent **claims 2-7** is considered to meet the requirements of Art. 33(2)-(4) PCT.

- 2 The subject-matter of independent **claim 14** lacks novelty according to Art. 33(2) PCT. The reasons are as follows.

Document D1 discloses a medical stethoscope head with a body (16) and a diaphragm portion (10) as defined in the preamble of **claim 14** (see fig. 1). The head comprises means for positioning and connecting the diaphragm portion to the body as defined in the last four lines of **claim 14** (see fig. 1). Any type of distinguishing and identifying indicia can be placed on the surface 22 of the diaphragm portion. Therefore, the surface 22 of the diaphragm portion can be considered as distinguishing means.

Accordingly, all features of **claim 14** are known from document D1.

- 3 In the additional features of **claims 15** and **17** can also be found in the stethoscope of document D1.

- 4 For the reasons given under point 1 above, the combination of features according to **claim 16** is considered to meet the requirements of Art. 33(2)-(4) PCT.
- 5 The diaphragm portion according to **claims 18-20** is known from document D1 (see fig.1; see also point 2 above).

A stethoscope head with distinguishing means for personalization and identification thereof

- 5 The present invention relates to a stethoscope head with distinguishing means for personalization and identification thereof, in particular a medical stethoscope head provided with a replaceable diaphragm cup and/or personalizing-identifying ring having such distinguishing means.

10 A medical stethoscope continuous to be a basic equipment both for doctors and graduate nurses, making the number of said stethoscopes enormous in every-day use. In connection with that, the problem of identifying a stethoscope and its user (owner) in health service institutions has emerged, especially when the stethoscopes come from one manufacturer.

15 As per observations of external appearance of the art known medical stethoscopes coming from different manufacturers, it is difficult to see any difference, between most of them, concerning their external shapes and basic details, and many of them look exactly the same, even in very fine elements, although manufacturers thereof are located in different and often very distant countries. It is a result of copying, striving for reduction of the production costs as well as using the uniformed elements, manufactured in long series by the specialized manufacturers. It especially applies to Y-shaped tubes, which join a head of the stethoscope with its headset, and  
20 to the elastic rings that fasten a diaphragm to a diaphragm cup, soft diaphragm covers and headframes.

A confusing similarity of stethoscopes leads to the considerable inconveniences resulting especially from the unintentional swap of stethoscopes by their users, which results from the difficulties to distinguish the official stethoscopes from the private ones, to identify the  
25 stethoscopes being the equipment of various departments of health service institutions, to identify the stethoscope by its individual user in the case it is accidentally placed next to the same model, etc. Besides, the companies, e.g. pharmaceutical companies, are not able to use medical stethoscopes for advertisement purposes and to brand them such that they would unequivocally differ, with an exemption of overprints on diaphragms or headset pipes, from the  
30 equipment used in the advertising campaigns of other companies. There also remains an unsatisfied demand directed to stethoscopes' manufacturers to unconventionally brand and/or decorate their products in relation to the competition's products or even to products of the same kind.

Attempts are known to distinguish stethoscopes by using various kinds of user-distinguishing or

decorative elements. US200100188 and publication of the international patent application WO 01/13788 disclose the decorative covers having a form of sleeves which are put on the whole stethoscopes or on their parts which couple the medical stethoscope head with the headset imitating the animals' heads, whose purpose is to reduce children's stress related to medical examination.

Patent US 5920038 discloses medical stethoscope head comprising a diaphragm with graphical marking. The diaphragm is exchangeable inside the head and can be adjusted in relation to a given patient or user. This arrangement is designed mainly for examining the children and its intended purpose is to reduce stress and aversion to medical examination.

Publication US2004/0048539 discloses a cover of the medical stethoscope head having a form of an elastic net, preferably of knitted fabric, or elastic cover imitating an animal head, which is put on the stethoscope head. The task of a cover is to reduce patients' discomfort, especially the children's one, resulting from the contact of a cold stethoscope head with a child's body.

In an offer of 3M company as given on www.3M website Worldwide: United States:HealthCare there can be found a description of ways for entering laser overprints, limited to 25 characters, on diaphragms and diaphragm of stethoscope heads.

Thus, the to-date used art known arrangements as applied to distinguish the medical stethoscope head of the same kind, result in a uniform and obscure personalization or attempt to positively impress the infant patients. Still, there are no solutions of the medical stethoscope heads of the same kind, that would unambiguously distinguish a single head in the very different ways, depending on personal preferences of a potential user or or in an exact accordance with his/her individual wishes and wishes of the companies which would intend to use them in the advertisement campaigns. The to-date arrangements to distinguish the medical stethoscope head, besides use of the removable decorative covers described in the a.m. publications US200100188, WO 01/13788 and US2004/0048539, are not suitable for the repeated procedures of cleaning, disinfecting and sterilizing, which are required for that kind of equipment. Generally, manufacturers do not allow either dipping of medical stethoscope heads in any liquid or steam sterilization, and they only recommend an external wiping with alcohol or soap solution in water and using low temperature sterilization with ethylene oxide. This causes many inconveniences. If an accidental wetting of medical stethoscope head occurs, the stethoscope has to be delivered to an authorized service, because its construction does not enable the user to personally dismantle it so as to remove liquid residuals and to properly dry the stethoscope. Medical stethoscope heads have to be periodically cleaned internally by an authorized service from the dirt that may get inside while keeping them in a pocket or during transportation in a medical bag. In case the sterilization is required, the medical stethoscope head has to be subject to a very long and expensive low temperature sterilization processes with ethylene oxide,

followed by a 36 hour long ventilation processes in the aeration chambers, which processes are available only in large hospitals.

The prior art includes the medical stethoscope heads with the exchangeable bells, the diaphragm bells inclusive, but these cannot remove the above-mentioned inconveniences completely, because the former are screwed on the threaded pins of stethoscope head body, hence they are not attached to the head's body in an unequivocal, always the same position in relation to axes of their inlet pipes. It disables their proper individualization, in the context of general design rules of designing, by depositing on the heads the individually designed distinguishing graphical and/or structural elements, e.g. such as personalizing structural elements, initials or user's name, logo of a company which uses a stethoscope in advertising campaigns, etc., which should not be located accidentally, but always in the same position in relation to the axis of the inlet pipe, which is often used by designers of personalizing elements as a point of reference for a distribution of individual elements which distinguish a stethoscope head.

There is also a market demand for the medical stethoscope heads, provided with the user-distinguishing elements, enabling their users to clean and wash them up and, if the need occurs, could be wholly subject to high temperature sterilization, especially steam sterilization.

Thus, an object of the invention is to provide a medical stethoscope head, a construction of which allows easy, distinct and broadest possible, user distinguishing marking in relation to other medical stethoscope heads of the same kind, manufactured in series by the same manufacturer, and easy identification thereof by the user or a group of users.

Another object of the invention is to provide a medical stethoscope head, the appearance of which would be easily changeable, also at the retail point of sale of sale, or by the stethoscope user by means of the simple and easy accessible tools.

Another object of the invention is to provide a medical stethoscope head, easy identifiable, also at retail point of sale, or by the stethoscope user, in accordance with individual preferences of the users, and adapted to a total dismantle by the user to subject it, both as a whole and in dismantled condition, to cleaning and sterilization, which is obligatory for such kind of medical equipment, also in the commonly accessible table top steam sterilizers.

Another object of the invention is to provide the exchangeable and distinct, distinguishing means for medical stethoscope head, which is easy to mount onto the medical stethoscope head in accordance with individual purchaser's preferences, at retail point of sale or by the user himself.

Further object of the invention is to provide easy exchangeable diaphragm cup for medical stethoscope head, which makes it possible to identify and distinctly personalize stethoscopes, also at retailers, according to preferences and wishing of individual users, and simultaneously it is adapted to be cleaned and sterilized, which is obligatory for that kind of medical equipment,

also in high temperature, especially may be sterilized by steam in the commonly available table top steam sterilizers.

The invention's intended purpose is carried out by the first embodiment of a medical stethoscope head comprising a body, an inlet pipe extending from the said body and having an axis, a diaphragm cup having an upper surface and a lower surface opposite to said upper surface, a diaphragm held at said lower surface of said diaphragm cup by a fastening ring, said stethoscope head characterized in that it comprises at least one ring for distinguishing and identifying a stethoscope; said personalizing-identifying ring having an upper surface, a lower surface, an outer side surface, an inner side surface and said personalizing-identifying ring located with its lower surface on said upper surface of said diaphragm cup in a preset angular position in relation to said axis of said inlet pipe; and distinguishing means provided on said upper surface of said at least one personalizing-identifying ring for distinguishing and identifying a stethoscope.

Preferably, on its lower surface said personalizing-identifying ring is provided with at least one positioning member adopted for cooperating with means provided on said diaphragm cup for explicit positioning said personalizing-identifying ring in the preset angular position in relation to said axis of said inlet pipe.

In particular, a fastening element, preferably a thread, catch or recess, is provided on one of said side surfaces of said personalizing-identifying ring to removably secure the said personalizing-identifying ring to the said diaphragm cup.

Also preferably, on one of its upper surface and lower surface, the said personalizing-identifying ring is provided with at least one threaded hole in which a fastening element is situated for securing said personalizing-identifying ring to the diaphragm cup. Especially, said personalizing-identifying ring can be composed of at least two separate members, and also it can be made of any material or set of materials, which are joined with each other in any combination.

Preferably, said fastening ring is elastic and said personalizing-identifying ring is formed integrally with said fastening ring.

The intended purpose of the invention is also carried out by a personalizing-identifying ring for distinguishing and identifying a medical stethoscope head comprising a body, an inlet pipe extending from said body and having an axis, a diaphragm cup having an upper surface and a lower surface and a diaphragm mounted at said lower surface of said diaphragm cup; said personalizing-identifying ring having an upper surface and lower surface and two side surfaces, outer and inner; said personalizing-identifying ring characterised in that it comprises a distinguishing means placed on said upper surface of said user-distinguishing ring; at least one positioning member placed on said lower surface of said ring and adopted for cooperating with means provided on said diaphragm cup for explicit positioning the personalizing-identifying ring in the

preset angular position in relation to an axis of said inlet pipe of said body.

In one embodiment, preferably, a fastening element, preferably thread, catch or recess, for connecting said ring with said diaphragm cup is placed on said at least one side surface of said ring.

- 5 In another embodiment of the invention, in said lower surface of said ring a hole for placing a screw or a pin, being a fastening element, is provided.

The personalizing-identifying ring may comprise at least two members and, preferably, may be made of any material or set of materials, connected with each other in any combination.

- 10 Further, an elastic fastening ring, which is an integral part of the user-distinguishing ring, can be attached to said outer side surface of the user-distinguishing ring.

- The intended purpose of the invention is carried out by another embodiment of a medical stethoscope head comprising: a body, an inlet pipe extending from said body and having an axis, at least one diaphragm cup having an upper surface, a lower surface opposite the said upper surface and being removably secured to said body for allowing exchanging of said diaphragm cup; a diaphragm secured to said lower surface of said diaphragm cup by a fastening ring; characterized by comprising means for identifying and distinguishing the stethoscope, said distinguishing means provided on said upper surface of said diaphragm cup; means for positioning and connecting said diaphragm cup to said body provided in said diaphragm cup and in said body and cooperating with each other for removably secured said diaphragm cup to said body in a preset angular position in relation to said axis of said inlet pipe.
- 15  
20

Said distinguishing means of said diaphragm cup comprises a region of said upper surface of said diaphragm cup distinguished by any decorative elements or by any other techniques.

- Said distinguishing means of said diaphragm cup may comprise a ring for identifying and personalizing a stethoscope, said personalizing-identifying ring having an upper surface, a lower surface, an outer side surface, an inner side surface and said personalizing-identifying ring being located with its lower surface on said upper surface of said diaphragm cup in a preset angular position in relation to said axis of said inlet pipe of said body.
- 25

For removably joining the diaphragm cup with said body, said positioning-connecting means is selected out of a screw joint, pin joint, bayonet joint and snap joint.

- 30 The intended purpose of the invention is also carried out by a diaphragm cup for a medical stethoscope head having a body provided with an inlet pipe extending from said body and having an axis; said diaphragm cup having an upper surface and a concave lower surface to which a diaphragm is mounted, and being provided with at least one joining element for removably secure said diaphragm cup to a body of a medical stethoscope head, characterized by

comprising: means for personalizing and identifying a stethoscope head positioned on the upper surface of said diaphragm cup; at least one location member for unequivocally positioning said diaphragm cup in said body in the preset angular position in relation to said axis of said inlet pipe of said body.

- 5 Said distinguishing means may comprise a region of said upper surface of said diaphragm cup distinguished by any decorative elements or any other technique.

On its upper surface, an annular recess may be formed for placing a user-distinguishing ring.

- The advantage of the subject invention is that it is possible to change an appearance of the medical stethoscope head in a simple manner, either by fastening the exchangeable  
10 personalizing-identifying ring having distinguishing means to the upper surface of the diaphragm cup or by removably fastening the exchangeable diaphragm cup provided with the distinguishing means. Such personalization of the medical stethoscope head may be provided not only by manufacturer, but also by the user or some point of service, by using simple tools. A user may select the personalizing-identifying ring (or a diaphragm cup having the distinguishing means)  
15 from manufacturer catalogue of the ready-made elements, may request that the additional distinguishing means according to personal preferences be provided or may order manufacturing of the personalizing-identifying ring (or diaphragm cup having distinguishing means) according to his own design using basic materials of stethoscope manufacturer.

- It is an advantage of the subject invention that the medical stethoscope head, provided with the  
20 personalizing-identifying ring or a diaphragm cup having distinguishing means, makes possible an easy and univocal association of the given stethoscope with its user and allows the user-identification of the particular model of the medical stethoscope head according to personal preferences of its future user on a day of purchase or in the future. When those personal preferences changed, it would be possible to easy swap of the personalizing-identifying ring  
25 because the manner of fastening both the personalizing-identifying ring and a diaphragm cup allows an easy swap for another one.

- It is an advantage of the subject invention that the number of the user-distinguishing variants of the medical stethoscope head for distinguishing it from other items of the same kind is practically unlimited, because the number of designs of distinguishing means by using any technologies,  
30 materials and colours is unlimited.

- The above feature ensures to the user of the stethoscope a comfort of distinguishing his/her stethoscope from other items of the same model, satisfies his/her aesthetic and ambition requirements and allows the companies that use stethoscopes in the advertising campaigns, individualizing the medical stethoscope head in such a way that stethoscopes are significantly  
35 distinguished from the same models of stethoscopes used in other campaigns.

The considerable advantage of the invention is that the medical stethoscope head according to the invention, can be easily dismantled into individual elements directly by the user, by using the commonly available tools to subject it to the periodic cleaning, washing, disinfections and high temperature sterilization procedures and in table top steam sterilizers commonly available in the physician's offices. The reassembling of the stethoscope head also has not to be made in a specialized service point, because the structure of the head guarantees repeatable locations of all the elements in relation to axis of the body inlet pipe of the medical stethoscope head.

The invention is depicted in the drawing of the embodiments, in which:

Fig. 1 is a perspective view of the first embodiment of the medical stethoscope head having a personalizing-identifying ring according to the invention, mounted therein;

Fig. 2 is a medical stethoscope head according to fig. 1, in a side view and partly in cross section;

Fig. 3 is a view of the medical stethoscope head dismantled into respective parts according to fig. 1 and 2, in perspective view;

Fig. 4 to 7 are cross sections of the subsequent modifications of the first embodiment of the medical stethoscope head, showing the alternative structures of the personalizing-identifying ring and fastening thereof to a diaphragm cup;

Fig. 8 is an embodiment of the user-distinguishing ring, in perspective view, partly in cross section;

Fig. 9 is the second embodiment of the medical stethoscope head having the user-distinguishing element in a form of the diaphragm cup according to invention, in a perspective view;

Fig. 10 to 20 are cross sections of the subsequent modifications of the medical stethoscope head of fig. 9, showing different preferred variants of the positioning-connecting means of the diaphragm cup of a stethoscope head;

Fig. 21 is a perspective view of an exchangeable diaphragm cup for the medical stethoscope head of fig. 9.

In the preferred embodiment in fig. 1-3, a medical stethoscope head comprises a body 2 having an inlet pipe 3 and diaphragm cup 4 with diaphragm 5 (shown in fig. 2-7). In a presented embodiment, the body 2 is provided with insulation ring 6. The diaphragm 5 is held at a diaphragm cup with fastening ring 7, and inlet pipe is positioned in the body 2 by using a pin 8 and a helical spring 9. The medical stethoscope head 1 may have any shape, such as, for instance, cardiologic, internist, paediatrician medical stethoscope heads, and the like.

According to the invention, at an upper surface 10 of the diaphragm cup 4 of the medical

stethoscope head 1, opposite to lower surface 10' adjacent to diaphragm 5, there is mounted a personalizing-identifying ring 11 having an upper surface 12, a lower surface 12', and outer 13 and inner 13' side surfaces. The personalizing-identifying ring is a separate element and is fastened in an optionally selected area of the upper surface 10 of the diaphragm cup 4 in a fixed position in relation to axis 3' of the inlet pipe 3. The personalizing-identifying ring 11 comprises the distinguishing means 14, which specifically may be the distinguishing texture or colour of the whole personalizing-identifying ring 11 and/or different kinds of the user-distinguishing marks located at its upper surface, such as overprints, engraved emblems and inscriptions, decorative elements fastened onto a part or its entire upper surface, a shape of its upper surface and the like. These distinguishing means 14 can be selected individually in accordance with the individual preferences of a stethoscope user and may be produced on the ready-made user-distinguishing rings 11, by the manufacturer of a medical stethoscope head or by the points of sale, by employing the manufacturer's basic elements.

The personalizing-identifying ring 11 in an embodiment in fig. 2, 3 is mounted on the upper surface 10 of the diaphragm cup 4, especially in recess 15 matching by shape and size the shape and size of the personalizing-identifying ring 11 and embracing, wholly or partly, the personalizing-identifying ring 11. In the embodiment of fig. 1-3, the recess 15 extends from a circumferential edge of the diaphragm cup 4 radially to its centre. To set of exact angular position of the personalizing-identifying ring 11 on the diaphragm cup 4 in relation to the axis 3' of the inlet pipe 3, and thus to unequivocally define a position of the distinguishing means 14 on the diaphragm cup 4, the personalizing-identifying ring 11 is provided with at least one location member 16 for placing it in the unequivocally fixed angular position in relation to axis 3' of the inlet pipe 3. In the embodiment in figs. 1-3, the location member 16 is in a form of a metal sphere, a lower part of which is fixed or removable mounted in a seat 162 provided on the upper surface 10 of the diaphragm cup 4, and its upper part is mounted in a seat 161 (shown in fig. 2) provided in the lower surface 12' of the personalizing-identifying ring 11.

In the embodiment of fig. 2, 3, the outer side surface 13 of the personalizing-identifying ring 11 comprises a fastening element 17 having a form of a thread, and the fastening ring 7 having a thread on its internal surface and supporting the diaphragm 5 at the diaphragm cup 4 is screwed on said thread. In such a manner, the personalizing-identifying ring 11 and the diaphragm 5 is simultaneously kept at the diaphragm cup 4.

Figs. 4-7 show other preferred variants of fastening the personalizing-identifying ring 11 to the diaphragm cup 4.

In a variant shown in fig. 4, the personalizing-identifying ring 11 is fastened to the diaphragm cup 4 with at least one fastening element 17 having a form of a screw, introduced from underneath to an aperture in the diaphragm cup and screwed into a threaded hole 17" in a lower surface 12' of

the personalizing-identifying ring 11. In this case, the screw is simultaneously a location member. In that embodiment, the fastening ring 7 is not connected with the personalizing-identifying ring 11.

In the variant shown in fig. 4a, the personalizing-identifying ring 11 is fastened to the diaphragm cup 4 by at least one fastening element 17 in a form of a pin, which is tightly positioned in an aperture 17a of the diaphragm cup 4 and in a blind hole in a lower surface 12' of the personalizing-identifying ring 11. In this case, a pin being a fastening element 17 is simultaneously, together with the holes, a location member.

In the variant in fig. 4b, the personalizing-identifying ring 11 is fastened, in push-in manner, into a circumferential recess 15 of the diaphragm cup 4 and the circumferential recess 15 is located distally from the diaphragm cup side surface. The diaphragm cup 4 is provided with apertures 17b cooperating with a location member for the personalizing-identifying ring 11 in a suitable angular position in relation to axis 3' of the inlet pipe 3 and serving for introduction of a pin pushing out the personalizing-identifying ring 11, in the case it is to be removed from the diaphragm cup 4.

In the variant shown in fig. 5, the personalizing-identifying ring 11 is fastened to the diaphragm cup 4 by the fastening element 17 in a form of the elastic fastening ring 7, which tightly encloses a lower edge of the diaphragm 5, a side surface of the diaphragm cup 4 and overlaps at upper surface 12 of the personalizing-identifying ring 11. Preferably, the rim of the personalizing-identifying ring 11 is shaped such that it comprises a cut-off in which an upper part of the elastic fastening ring 7 is positioned.

Fig. 6 shows an embodiment of the medical stethoscope head similar to those of fig. 5, an elastic fastening element being connected with the outer side surface of the personalizing-identifying ring 11 and forming an integral part thereof and being simultaneously a fastening ring 7 for a diaphragm 5.

The inner side surface 13' of the personalizing-identifying ring 11 is provided with an additional fastening element 17' in a form of a continuous or point circumferential protrusion 18, located in a groove 18' formed in a side surface of the recess 15 for the personalizing-identifying ring 11 in the diaphragm cup 4. The additional fastening element 17' provides a holding of the personalizing-identifying ring 11 and fastening ring 7 at the diaphragm cup 4.

Fig. 7 presents a subsequent embodiment of the medical stethoscope head, which comprises the personalizing-identifying ring 11 fastened to the diaphragm cup 4 by a fastening element 17 in a form of a spring ring. The spring ring is located in a seat formed between the personalizing-identifying ring 11 and the diaphragm cup 4. The seat for the spring ring is in a form of a circumferential groove in an inner side surface 13' of the personalizing-identifying ring 11 and a

circumferential groove in a side surface of the recess 15 in the diaphragm cup 4. The outer side surface 13 of the personalizing-identifying ring 11 contacts a fastening ring 7 by which the diaphragm 5 is supported on the diaphragm cup 4. In such an arrangement, the diaphragm cup 4 is provided with at least one aperture 17b, which cooperates with the element positioning the angular position of the personalizing-identifying ring and is made between upper 10 and lower 10' surfaces of the diaphragm cup 4. The aperture 17b allows pushing the personalizing-identifying ring 11 out and separating it from the diaphragm cup 4 as a result of pushing it out with a tool in a form of a pin.

In each case, the personalizing-identifying ring 11 may form one piece or may be sectioned and comprise any number of members, if it is possible to keep them at the surface of the diaphragm cup 4 to form the distinguishing means.

Of course, figs. 1-7's depicted embodiments of the personalizing-identifying ring 11 and its fastening and location members are only exemplary. The skilled one may anticipate many different elements for fastening the personalizing-identifying ring 11 and for fixing a position of the personalizing-identifying ring 11 in relation to axis 3' of the inlet pipe 3 of the medical stethoscope head 1 such as elements of different snap and pin connections and the like. In some specific cases, the personalizing-identifying ring 11 may be glued to the diaphragm cup 4.

Fig. 8 shows the personalizing-identifying ring 11 according to the invention constituting an enlarged view of the ring described in connection with figs. 2 and 3. The upper surface 12 of the personalizing-identifying ring 11 is provided with, for example, an engraved inscription and set of three decorative hemispheres of different diameters, and at its lower surface 12', designed to contact the diaphragm cup 4, there is at least one location member 16 for an unequivocal location of an angular position of the personalizing-identifying ring 11 in relation to axis 3' of the inlet pipe 3 of the body 2 after mounting the ring in the medical stethoscope head 1. In the embodiment in fig. 8, a location member is a seat 161 formed in a lower surface 12' of the personalizing-identifying ring 11, designed for receiving a sphere 16 (shown in figs. 2 and 3). The outer side surface 13 is provided with a fastening element 17 in a form of a thread for holding the personalizing-identifying ring 11 at the diaphragm cup 4 by a threaded fastening ring 7 for fastening the diaphragm 5.

The personalizing-identifying ring 11 of the medical stethoscope head 1 according to the invention may be designed as described in relation to figs. 4-7. As shown, an element for fastening the personalizing-identifying ring 11 to the diaphragm cup 4 may be, e.g., at least one catch, thread or recess located on side surfaces 13, 13' or a hole for placing screw or pin located on the lower surface 12'.

As shown in fig. 6, an additional elastic ring being an integral part of the personalizing-identifying

ring 11 may be attached to its outer side surface 13. The elastic ring functions as an element for fastening the personalizing-identifying ring 11 to the diaphragm cup 4 as well as a fastening ring 7 supporting the diaphragm 5.

The personalizing-identifying ring 11 may be made of any material or combination of materials connected in any combination provided that they meet the requirements for cleaning and sterilizing the medical stethoscope head.

The personalizing-identifying ring 11 may have any width and thickness; it can be made as a single- or multi-layer item, mono-colour or in combination of many colours, of one or more materials that are connected in any combination. Its upper surface 12 may be of any shape. Also, its side surfaces 13 and 13' may be of any shape depending on a variant of its fastening to the diaphragm cup 4.

Fig. 9 shows another embodiment of the medical stethoscope head 1, which, like in the embodiment shown in figs. 1-3, may be of any shape and it comprises the same parts. The difference is that, according to the invention, the medical stethoscope head 1 as presented in fig. 9 comprises the diaphragm cup 4, which at its upper surface 10, opposite to the lower surface 10' adjacent to diaphragm (not shown) has the distinguishing means 14 for distinguishing a medical stethoscope head from all other medical stethoscope heads of that kind. The distinguishing means 14 comprises, for instance, an engraved user name, and a set of the colourful, user-distinguishing decorative elements. Simultaneously, the diaphragm cup 4 is removably joined to a body 2 by at least one positioning-fastening unit 20 allowing a swap of the diaphragm cup 4 and holding the preset angular position of the diaphragm cup 4 in relation to axis 3' of the inlet pipe 3 of the body 1.

An area distinguished by any method, for instance the ones described above in relation to the personalizing-identifying ring 11, may form the distinguishing means 14 of the diaphragm cup 4. The distinguishing means 14 may also be formed by the personalizing-identifying ring 11 mounted in any area at an upper surface 10 of the diaphragm cup 4 and provided with at least one location member to unequivocally settle its angular position in relation to axis 3' of an inlet pipe 3 of a body 2.

Figs. 10-20 show the different variants of the diaphragm cup 4 and a body 2. The medical stethoscope head of fig. 10 comprises a positioning-connecting means 20 which may comprises a bayonet coupling.

The medical stethoscope head in fig. 11 comprises a positioning-connecting means 20 comprising a fastening circumferential spring ring, which is placed partly in the joining element 21, in the form of a groove, of the diaphragm cup 4 and partly in the joining element, in the form of the groove, of the body 2. The positioning-connecting means 20 comprises also at least one

axially positioned location pin positioned in the location member 22, in the form of an aperture, of the diaphragm cup 4.

The medical stethoscope head in fig. 12 has a positioning-connecting means 20 comprising a fastening circumferential locking ring and at least one axial positioning pin. The medical stethoscope head from fig. 13 comprises a positioning-connecting means 20 in form of at least one an axially positioned expanding pin. The medical stethoscope head of fig. 14 has a positioning-connecting means 20 comprising a positioned centrally bolt, which is axially fastened and at least one axial positioning pin. The medical stethoscope head shown in fig. 15 comprises a positioning-connecting means 20 in a form of a nut, which is mounted on a threaded lower pin of a body 2 and at least one axial positioning pin. The medical stethoscope head shown in fig. 16 comprises positioning-connecting means 20 having a threaded joint located between the diaphragm cup 4 and a body 2 and a catch, which is situated between the sides of the diaphragm cup 4 and a body 2. The medical stethoscope head from fig. 17 comprises positioning-connecting means 20 similar to that from fig. 16, but in that case, a catch extends along full diameter of the threaded part of a body 2. The medical stethoscope head from fig. 18 comprises positioning-connecting means 20 having a pin, which extends transversally by a protrusion of the diaphragm cup 4 and a body 2. The medical stethoscope head from fig. 19 comprises, especially preferably, a positioning-connecting means 20, the same as shown also in figs. 2 and 3, comprising axially positioned screws, which pass through the aperture, constitute joining elements 21 and location members 22 and formed in the diaphragm cup 4, and screwed into a body 2. The medical stethoscope head from fig. 20 comprises a positioning-connecting means 20 providing with a screwed joint between the diaphragm cup 4 and a body 2 and a catch positioned axially between the diaphragm cup 4 and a body 2.

The arrangements of positioning-connecting means 20 presented above do not exhaust all the possible structures, which are evident to the skilled persons. Any suitable mechanic structures can be used provided that they unequivocally and repeatedly locate the diaphragm cup 4 in a preset angular position in relation to axis 3' of the inlet pipe 3, allow to removably fasten the diaphragm cup 4 to a body 2 and to give a possibility for exchanging the diaphragm cup 4 by simple and easy available tools such that the exchange could be made in a retail point and by the user himself.

Fig. 21 shows one of the possible embodiments of the exchangeable diaphragm cup for a medical stethoscope head. The diaphragm cup 4 comprises a concave lower surface 10', to which a diaphragm is fasten, and an opposite upper surface 10 provided with a distinguishing means 14, which is composed of, for instance, a user-presenting inscription made by any method, and set of identical decorating-user-distinguishing elements made of material different from the remaining part of the diaphragm cup. The diaphragm cup includes three apertures which

constitute joining elements 21 for the screws, the same as in fig. 19, which are designed both to fasten the diaphragm cup 4 to a body 2 and to unequivocally settle the diaphragm cup 4 in a preset angular position in relation to axel 3' of the inlet pipe 3 of a body 2.

For instance, the distinguishing means 14 of the diaphragm cup is an area distinguished by any elements and any method, as described in the reference to a user-distinguishing ring.

For instance, as an joining element 21 of the diaphragm cup 4 for attachment can be a hole for placing screws (best visible in fig. 19), a groove for placing a spring ring (shown in fig. 11), and a thread at surface of central hole in the diaphragm cup (fig. 15) and the like. A location member 22 of the diaphragm cup 4 for establishing position can be in form of a hole for placing screw (fig. 19) or pin (fig. 11), a hole for placing a catch (fig. 17), positioning protrusions, etc.

At an outer surface of the diaphragm cup there is normally a thread for screwing a ring 7 on for fastening a diaphragm 5 or a circumferential recess, which is in a form of a catch for fastening of elastic ring for retaining a diaphragm.

In the especially preferred embodiment, on the upper surface of the diaphragm cup 4 there is an annular recess for positioning therein the personalizing-identifying ring 11. The diaphragm cup 4 may comprise one or more layers; it can be made of one or more materials connected in any combination. The shape of its upper surface 10 may be optional.

The invention was described with reference to the preferred embodiments that should not be treated in a limited sense. The different modifications and variants of the presented arrangements are possible, provided that they are included in the attached claims.

IAP20 Rec'd PCT/PTO 08 FEB 2006

## Claims amended under Article 34 PCT

1. A medical stethoscope head (1) comprising:

a body (2);

an inlet pipe (3) extending from said body (2) and having an axis (3');

a diaphragm cup (4) having an upper surface (10) and a lower surface (10') opposite to said upper surface (10);

a diaphragm (5) held at said lower surface (10') of said diaphragm cup (4) by a fastening ring (7);

said stethoscope head characterised in that it comprises:

at least one personalizing-identifying ring (11) for distinguishing and identifying a stethoscope; said personalizing-identifying ring (11) having an upper surface (12), a lower surface (12'), an outer side surface (13), an inner side surface (13') and said personalizing-identifying ring (11) located with its lower surface (12') on said upper surface (10) of said diaphragm cup (4) in preset angular position in relation to said axis (3') of said inlet pipe (3);

distinguishing means (14) for personalizing and identifying the stethoscope provided on said upper surface (12) of said at least one personalizing-identifying ring (11) for distinguishing and identifying a stethoscope.

2. A medical stethoscope head according to claim 1, characterised in that on its lower surface (12') said personalizing-identifying ring (11) is provided with at least one positioning member (16) adopted for cooperating with means provided on said diaphragm cup (2) for explicit positioning said personalizing-identifying ring (11) in the preset angular position in relation to said axis (3') of said inlet pipe (3).

3. A medical stethoscope head according to claim 1 or 2, characterised in that a fastening element (17), preferably a thread, catch or recess, is provided on one of said side surface (13, 13') of said personalizing-identifying ring (11) for removably secured said personalizing-identifying ring (11) to said diaphragm cup (4).

4. A medical stethoscope head according to claim 1 or 2, characterised in that on one of its upper surface (12) and lower surface (12') said personalizing-identifying ring (11) is provided with at least one threaded hole (17") in which a fastening element (17) is situated for securing said

personalizing-identifying ring (11) to the diaphragm cup (4).

5. A medical stethoscope head according to claim 1 or 2, characterised in that said personalizing-identifying ring (11) is composed of at least two separate members.

6. A medical stethoscope head according to claim 1, characterised in that said personalizing-identifying ring (11) is made of any material or set of materials, which are joined each other in any combination.

7. A medical stethoscope head according to claim 1, characterised in that said fastening ring (7) is elastic and said personalizing-identifying ring (11) is formed integrally with said fastening ring (7).

8. A personalizing-identifying ring for distinguishing and identifying a medical stethoscope head provided with a body (2), an inlet pipe (3) extending from said body (2) and having an axis (3'), a diaphragm cup (4) having an upper surface (10) and a lower surface (10') and a diaphragm (5) mounted at said lower surface (10') of said diaphragm cup (4); said personalizing-identifying ring having an upper surface (12) and lower surface (12') and two side surfaces, outer (13) and inner (13'),

said personalizing-identifying ring characterised in that it comprises:

distinguishing means (14) placed on said upper surface (12) of said personalizing-identifying ring (11);

at least one positioning member (16,161) placed on said lower surface (12') of said ring (11) and adopted for cooperating with means provided on said diaphragm cup (4) for explicit positioning the personalizing-identifying ring (11) in the preset angular position in relation to an axis (3') of said inlet pipe (3) of said body (2).

9. An personalizing-identifying ring according to claim 8, characterised in that a fastening element (17), preferably thread, catch or recess, for connecting said personalizing-identifying ring (11) to said diaphragm cup (4) is placed at said at least one side surface (13, 13') of said personalizing-identifying ring (11).

10. An personalizing-identifying ring according to claim 8, characterised in that in said lower surface (12') of said personalizing-identifying ring (11) a hole for placing a screw or a pin, being a fastening element (17), is provided.

11. An personalizing-identifying ring according to claim 1, characterised in that it comprises at least two members.

12. An personalizing-identifying ring according to claim 8, characterised in that it is made of any material or set of materials connected each other in any combination.

13. An personalizing-identifying ring according to claim 8, characterised in that an elastic fastening ring (7), being a integral part of said personalizing-identifying ring (11) is attached to said its outer side surface (13).

14. A medical stethoscope head (1) comprising:

a body (2);

an inlet pipe (3) extending from said body (2) and having an axis (3');

at least one diaphragm cup (4) having an upper surface (10), a lower surface (10') opposite to said upper surface (10) and being removably secured to said body (2) for allowing exchanging of said diaphragm cup (4);

a diaphragm (5) held at said lower surface (10') of said diaphragm cup (4) by a fastening ring (7);

said stethoscope head characterised in that it comprises:

distinguishing means (14) provided on said upper surface (10) of said diaphragm cup (4) for distinguishing and identifying a stethoscope;

means (20) for positioning and connecting said diaphragm cup (4) to said body (2) provided in said diaphragm cup (4) and in said body (2) and cooperating with each other for removably secured said diaphragm cup (4) to said body (2) in the preset angular position in relation to said axis (3') of said inlet pipe (2).

15. A medical stethoscope head according to claim 14, characterised in that said distinguishing means (14) of said diaphragm cup (4) comprises a region of said upper surface (10) of said diaphragm cup (4) distinguished by any decorative elements or by any other techniques.

16. A medical stethoscope head according to claim 14, characterised in that said distinguishing means (14) of said diaphragm cup (4) comprises a personalizing-identifying ring (11) for distinguishing and identifying a stethoscope, said personalizing-identifying ring (11) having an upper surface (12), a lower surface (12'), an outer side surface (13), an inner side surface (13') and said personalizing-identifying ring (11) being located with its lower surface (12') on said upper surface (10) of said diaphragm cup (4) in the preset angular position in relation to said axis (3') of said inlet pipe (3) of said body (2).

17. A medical stethoscope head according to claim 14, characterised in that said positioning-connecting means (20) is selected from a screw joint, pin joint, bayonet joint and snap joint.

18. A diaphragm cup (4) for a medical stethoscope head (1) having a body (2) provided with an inlet pipe (3) extending from said body (2) and having an axis (3'); said diaphragm cup (4) having an upper surface (10) and a concave lower surface (10') to which a diaphragm (5) is

mounted, and being provided with at least one joining element (21) for removably secured said diaphragm cup (4) to a body (2) of a medical stethoscope head (1),

said diaphragm cup characterised in that it comprises:

distinguishing means (14) placed on upper surface (10) of said diaphragm cup (4) for personalizing and identifying a stethoscope head (1);

at least one positioning member (22) adopted for cooperating with means provided on said body (2) for explicit positioning said diaphragm cup (4) in said body (2) in the preset angular position in relation to said axis (3') of said inlet pipe (3) of said body (2).

19. A diaphragm cup according to claim 18, characterised by that said distinguishing means (14) comprises a region of said upper surface (10) of said diaphragm cup (4) distinguished by any decorative elements or by any other techniques.

20. A diaphragm cup according to claim 18, characterised by that on its upper surface (10) an annular recess (15) is formed for placing a personalizing-identifying ring (11).

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